

We claim:-

1. An alkyldiketene-containing aqueous polymer dispersion, which is obtainable by miniemulsion polymerization of hydrophobic monoethylenically unsaturated monomers in the presence of alkyldiketenes.
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2. An alkyldiketene-containing aqueous polymer dispersion as claimed in claim 1, which is obtainable by emulsifying an organic phase, which contains
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 - at least one alkyldiketene and
 - at least one monoethylenically unsaturated hydrophobic monomer

in solution, in the presence of a surface-active agent in an aqueous phase with the aid of a mechanical emulsification process with formation of a miniemulsion having a particle size of the emulsified organic phase of not more than 500 nm, at least one of the two phases additionally containing a free radical polymerization initiator or a polymerization initiator being added to the miniemulsion, and polymerizing the monomers of the miniemulsion.

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- 20 3. An alkyldiketene-containing aqueous polymer dispersion as claimed in claim 1 or 2, wherein the organic phase is emulsified in the aqueous phase by the action of ultrasound or with the aid of a high pressure homogenizer.
- 25 4. An alkyldiketene-containing aqueous polymer dispersion as claimed in any of claims 1 to 3, wherein the organic phase additionally contains a nonpolymerizable hydrophobic compound.
5. An alkyldiketene-containing aqueous polymer dispersion as claimed in any of claims 1 to 4, wherein the organic phase additionally contains a water-insoluble monomer which is selected from vinyl esters of C₁₂-C₂₂-carboxylic acids, vinyl ethers of C₁₂-C₃₀-alcohols and C₁₂-C₂₂-alkyl acrylates.
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6. An alkyldiketene-containing aqueous polymer dispersion as claimed in any of claims 1 to 5, wherein the organic phase comprises a solution, a binary or polynary mixture and/or a dispersion which contains
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 - at least one C₁₄- to C₂₂-alkyldiketene,
 - at least one monomer from the group consisting of styrene, methylstyrene, C₂- to C₂₈-olefins, esters of monoethylenically unsaturated carboxylic acids of 3 to 5 carbon atoms and monohydric alcohols of 1 to 22 carbon atoms, vinyl esters of C₁- to C₁₈-carboxylic acids, acrylonitrile and methacrylonitrile, and
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 - at least one hydrocarbon, an alcohol of 10 to 24 carbon atoms, a hydrophobic polymer having a molar mass M_w of $<10\,000$, a tetraalkylsilane, a vinyl ester of C_{12} – C_{22} -carboxylic acids, a vinyl ether of C_{12} – C_{30} -alcohols, a C_{12} – C_{22} -alkyl acrylate and/or a mixture of said compounds.

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7. An alkyldiketene-containing aqueous polymer dispersion as claimed in any of claims 1 to 6, wherein the organic phase comprises a solution which contains

 - stearyldiketene, palmityldiketene and/or behenyldiketene,
 - styrene, n-butyl acrylate, sec-butyl acrylate, tert-butyl acrylate, 2-ethylhexyl acrylate, methyl methacrylate, n-butyl methacrylate, acrylonitrile, methacrylonitrile and/or vinyl acetate and
 - hexadecane, olive oil, polystyrene having a molar mass M_w of from 500 to 5000, siloxanes having a molar mass M_w of from 500 to 5000, cetyl alcohol, stearyl alcohol, palmityl alcohol, behenyl alcohol, vinyl esters of C_{12} – C_{22} -carboxylic acids, vinyl ethers of C_{12} – C_{30} -alcohols and/or C_{12} – C_{22} -alkyl acrylates.

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8. An alkyldiketene-containing aqueous polymer dispersion as claimed in any of claims 1 to 7, wherein the organic phase comprises a solution which contains

 - stearyldiketene and/or palmityldiketene and
 - styrene, n-butyl acrylate, tert-butyl acrylate and/or acrylonitrile.

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9. An alkyldiketene-containing aqueous polymer dispersion as claimed in any of claims 1 to 8, wherein the organic phase additionally contains hydrophilic monomers in amounts such that the resulting copolymers have a solubility of not more than 10, preferably not more than 50, g/l in water at 20°C and a pH of 2.

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10. An alkyldiketene-containing aqueous polymer dispersion as claimed in claim 9, wherein at least one compound from the group consisting of the ethylenically unsaturated carboxylic acids of 3 to 5 carbon atoms, acrylamide, methacrylamide, N-vinylformamide, vinyl ethers, 2-acrylamido-2-methylpropane-sulfonic acid, vinylsulfonic acid, styrenesulfonic acid, sulfopropyl acrylate, sulfopropyl methacrylate, fumaric acid, maleic acid, itaconic acid and/or maleic anhydride is used as the hydrophilic monomer.

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11. An alkyldiketene-containing aqueous polymer dispersion as claimed in any of the preceding claims, which are obtainable by miniemulsion polymerization in the presence of at least one water-soluble and/or water-swella-

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ble polysaccharide.

12. An alkyldiketene-containing aqueous polymer dispersion as claimed in claim 11, which is obtainable by mixing the miniemulsion with an aqueous solution which contains at least one water-soluble and/or water-swella-
5 ble polysaccharide, and polymerizing the monomers of the miniemulsion in the presence of the water-soluble and/or water-swella-
ble polysaccharide.
13. A process for the preparation of an alkyldiketene-containing aqueous polymer dispersion, wherein the miniemulsion polymerization of hydrophobic monomers is carried out in the presence of alkyldiketenes.
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14. A process for the preparation of an alkyldiketene-containing aqueous polymer dispersion as claimed in claim 13, wherein an organic phase which contains
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 - at least one alkyldiketene and
 - at least one monoethylenically unsaturated hydrophobic monomer
 in solution is emulsified in the presence of a surface-active agent in an aqueous phase with the aid of a mechanical emulsification process with formation of a
20 miniemulsion having a particle size of the emulsified organic phase of not more than 500 nm, at least one of the two phases additionally containing a free radical polymerization initiator or a polymerization initiator being added to the miniemulsion, and the monomers of the miniemulsion are then polymerized.
- 25 15. A process as claimed in claim 13 or 14, wherein the organic phase additionally contains at least one nonpolymerizable hydrophobic compound.
16. A process as claimed in any of claims 13 to 15, wherein the organic phase additionally contains a water-insoluble monomer which is selected from vinyl
30 esters of C₁₂-C₂₂-carboxylic acids, vinyl ethers of C₁₂-C₃₀-alcohols and C₁₂-C₂₂-alkyl acrylates.
17. A process as claimed in any of claims 13 to 16, wherein the organic phase comprises a solution, a binary or polynary mixture and/or a dispersion which
35 contains
 - at least one C₁₄- to C₂₂-alkyldiketene and
 - at least one monomer from the group consisting of styrene, methylstyrene, C₂- to C₂₈-olefins, esters of monoethylenically unsaturated carboxylic acids of 3 to 5 carbon atoms and monohydric alcohols of 1 to 22 carbon atoms, vinyl esters of C₁- to C₂₂-carboxylic acids, acrylonitrile and
40 methacrylonitrile.

18. A process as claimed in any of claims 13 to 17, wherein the organic phase comprises a solution which contains
- stearyldiketene and/or palmityldiketene and
 - styrene, n-butyl acrylate, tert-butyl acrylate and/or acrylonitrile.
19. A process as claimed in any of claims 13 to 18, wherein the organic phase contains, as the nonpolymerizable hydrophobic compound, a hydrocarbon, an alcohol of 10 to 24 carbon atoms, a hydrophobic polymer having a molar mass Mw of <10 000, a tetraalkylsilane and/or a mixture of said compounds.
20. A process as claimed in any of claims 13 to 19, wherein the aqueous phase contains a surface-active anionic compound.
21. A process as claimed in any of claims 13 to 20, wherein the aqueous phase contains, as surface-active agent, sodium laurylsulfate, sodium dodecylsulfate, sodium hexadecylsulfate, sodium dioctylsulfosuccinate and/or at least one adduct of from 15 to 50 mol of ethylene oxide with 1 mol of a C₁₂- to C₂₂-alcohol.
22. A process as claimed in any of claims 13 to 21, wherein the organic phase additionally contains hydrophilic monomers in an amount such that the resulting copolymers have a solubility of not more than 10, preferably not more than 50, g/l in water at 20°C and a pH of 2.
23. A process as claimed in claim 22, wherein at least one compound from the group consisting of the ethylenically unsaturated carboxylic acids of 3 to 5 carbon atoms, acrylamide, methacrylamide, N-vinylformamide, vinyl ethers, 2-acrylamido-2-methylpropanesulfonic acid, vinylsulfonic acid, styrenesulfonic acid, sulfopropyl acrylate, sulfopropyl methacrylate, fumaric acid, maleic acid, itaconic acid and/or maleic anhydride is used as the hydrophilic monomer.
24. A process as claimed in any of claims 13 to 23, wherein the miniemulsion polymerization is carried out in the presence of at least one water-soluble and/or water-swellaable polysaccharide.
25. A process as claimed in claim 24, wherein the miniemulsion is mixed with an aqueous solution which contains an aqueous starch and the mixture is polymerized in the presence of at least one polymerization initiator.
26. A process as claimed in either of claims 24 or 25, wherein the miniemulsion is mixed with an aqueous solution which contains a degraded starch in solution.

27. A process as claimed in any of claims 24 to 26, wherein the miniemulsion is mixed continuously or batchwise with the aqueous solution of a water-soluble polysaccharide and polymerized.
- 5 28. A process as claimed in any of claims 24 to 27, wherein the water-soluble polysaccharide used is a degraded starch.
29. The use of an alkyldiketene-containing aqueous polymer dispersion as claimed in any of claims 1 to 9 as a size for paper or as a water repellent for leather,
10 natural and/or manmade fibers and textiles.